EXPLORING THE CONSEQUENCES OF DISCRIMINATION AND HEALTH FOR RETIREMENT BY RACE AND ETHNICITY: RESULTS FROM THE *HEALTH AND RETIREMENT STUDY*

Ernest Gonzales, Yeonjung Jane Lee, William V. Padula, and Lindsey Subin Jung

Center for Retirement Research at Boston College
Hovey House
140 Commonwealth Avenue
Chestnut Hill, MA 02467
Tel: 617-552-1762 Fax: 617-552-0191
http://crr.bc.edu

Ernest Gonzales is an assistant professor at the Boston University School of Social Work. Yeonjung Jane Lee is a Ph.D. candidate at the Boston University School of Social Work. William V. Padula is an assistant professor at the Johns Hopkins Bloomberg School of Public Health. Lindsey Subin Jung is an M.S. candidate at the Boston University School of Public Health.

About the Steven H. Sandell Grant Program

About the Center for Retirement Research

The Center for Retirement Research at Boston College, part of a consortium that includes parallel centers at the University of Michigan and the National Bureau of Economic Research, was established in 1998 through a grant from the Social Security Administration. The Center's mission is to produce first-class research and forge a strong link between the academic community and decision-makers in the public and private sectors around an issue of critical importance to the nation's future. To achieve this mission, the Center sponsors a wide variety of research projects, transmits new findings to a broad audience, trains new scholars, and broadens access to valuable data sources.

Center for Retirement Research at Boston College
Hovey House
140 Commonwealth Ave
Chestnut Hill, MA 02467
Tel: 617-552-1762   Fax: 617-552-0191
http://crr.bc.edu

Affiliated Institutions:
The Brookings Institution
Syracuse University
Urban Institute

Abstract

This paper examines the association of structural discriminatory risk factors and health with retirement age. It uses data from the *Health and Retirement Study* (HRS). Critical components of the analysis include ordinary least squares regressions to evaluate associations of discrimination (major lifetime discrimination, neighborhood disadvantage, work discrimination and everyday discrimination) and health with retirement age, while controlling for time, cohort, race, ethnicity, gender, marital status, education, health insurance, income and wealth. Interaction effects explore differences by discrimination and health. Individuals' ages 51+, employed full-time, part-time, or unemployed were drawn from the HRS Leave-Behind Questionnaire in 2006. Approximately half of the sample retired during the observation period 2008-2014. Key limitations are that valid and reliable measures of discrimination were queried only twice during an 8-year period, limiting our understanding of the timing of events as they relate to health and economic outcomes.

The paper found that:

- The prevalence of discrimination across race and ethnicities was high. Blacks report the highest levels of major lifetime discrimination, Hispanics and blacks report the highest levels of neighborhood disadvantage, and whites report the highest levels of work and everyday discrimination compared to their counterparts.
- Bivariate results reveal that discrimination across ecological contexts (major lifetime discrimination, neighborhood disadvantage, work discrimination and everyday discrimination) are negatively associated with retirement age.
- Multivariate analyses found that early retirement was significantly associated with two important predictors: major lifetime discrimination led to retirement approximately 0.75 years earlier ($p<.01$) and work discrimination resulted in retirement approximately 0.58 years earlier ($p<.05$). Interaction effects were not significant.

The policy implications of the findings are:

- Federal, state and employer policies and practices that protect individuals from major lifetime and work discrimination will likely expand productive engagement among white, racial, and ethnic minority workers.

- The Protecting Older Workers Against Discrimination Act (S. 443) is a bipartisan bill currently under review in Congress. This legislation would reinstate the original intent of age being *a* factor to discrimination, as opposed to the *primary factor*, in the Age Discrimination in Employment Act.

- Similarly, the Fair Employment Protection Act (S. 2019) aims to protect individuals from modern and covert forms of discrimination based on age and other characteristics within the workplace.

- The Department of Labor could collaborate with the president to develop guidelines for workplace or anti-discrimination statutes through executive order.

- Organizational psychology research offers several ideas about how to challenge stereotyping and discrimination, including swift, just, and consist sanctioning of instigators within organizations (Pearson et al., 2000; Pearson & Porath, 2004); developing a "common in-group identity model" in the workplace (Gaertner & Dovido, 2000); and increasing personal awareness about biases and attitudinal dispositions and fostering the ability to see the individual rather than a stereotype.

Background

      Ensuring health and economic security in later life are national priorities (White House Conference on Aging, 2015). The concept of productive aging advances the perspective that we need to better develop and utilize the capacity and choices of individuals to engage in economic activities in later life (Gonzales, Matz-Costa, & Morrow-Howell, 2015; Morrow-Howell, Gonzales, Harootyan, Lee & Lindberg, 2017; Munnell & Sass, 2008). Working longer will likely result in multiple benefits, such as reduced reliance on social insurance programs and increased contributions to the national economy and will bolster economic security for older adults and their families (Morrow-Howell, Hinterlong & Sherraden, 2001; Munnell & Sass, 2008). Moreover, working longer is the key to a financially secure retirement (Munnell, 2011) and is especially important for racial and ethnic minorities, who have significantly less retirement savings (Rhee, 2013) and are more likely to be poor than non-Hispanic Whites (Issa & Zedlewski, 2009).

      Discrimination is structural (Krieger, 2012) and disproportionately affect minority populations (Delgado & Stephancic, 2012; Miller & Garran, 2008). Yet, we are unaware of research that examines how the cumulative disadvantages across ecological domains including major lifetime discrimination, living in disadvantaged neighborhoods, workplace discrimination and everyday discrimination relate to health and retirement.

Theory and Evidence

      This study adapts a conceptual framework of health disparities (Warnecke, Oh, Breen, Gehlert, et al., 2008) and builds on previous attempts to integrate discriminatory events across ecological contexts (Ayalon & Gum, 2011; Luo, Xu, Granberg & Wentworth, 2011) to explore its impact on health and work. Major discriminatory events, as well as everyday experiences of discrimination "get under the skin" and have a wear-and-tear effect on psychosocial health (Ayalon & Gum, 2011; Dovido, Kawakami, & Gaertner, 2002; Hebl, Foster, Mannix, & Dovidio, 2002; Jackson & Knight, 2006; Lewis, Aiello, Leurgans, Kelly & Barnes, 2010; Pascoe & Richman, 2009; Taylor, Repetti, & Seeman, 1997; Williams & Mohammed, 2009; Williams, Neighbors, & Jackson, 2003). Ferraro and Shippee (2009) suggest that social and environmental stressors result in physiological activation of adrenal hormones and autonomic nervous systems. While occasional physiological adaptations and disruptions are normal, chronic stressors and

activation may accelerate the aging process and senescence, heightening vulnerability to disease and disorders (Miller & Chen, 2013; Shonkoff, 2010). These findings resonate well with cumulative inequality theory (Ferraro & Shippee, 2009; Ferraro & Morton, 2018), where the quality of ecological domains (e.g., neighborhoods, workplaces), combined with biopsychosocial factors of interpersonal relationships, can improve or compromise mental, physical and overall health.

There is growing evidence that discrimination is stressful and undermines health (Broman, 1996; Ong, Fuller-Rowell, & Burrow, 2009). Chae, et. al. (2014) found that race-based discrimination results in greater psychosocial stress and may help explain inequitable life expectancies among African American men. Racial and ethnic minorities suffer undue burden of health disparities due to a wide range of social, economic, and environmental factors (Braveman & Barclay, 2009). Research has shown deleterious health outcomes are associated with experiences of major lifetime discrimination (Ayalon & Gum, 2011; Williams, et al. 2008); living in disadvantaged neighborhoods (Glymour, Mujahid, Wu, White & Tchetgen, 2010; Williams & Collins, 1995); experiencing work discrimination (Deitch et al., 2003; Marchiondo, Gonzales & Ran, 2015; McCluney, Schmitz, Hicken, & Sonnega, 2018); and everyday discrimination (Gee, Spencer & Chen, 2007; Lewis et. al., 2010; Sternthal, Slopen & Williams, 2011). Discrimination in employment, housing, education, as well as daily discriminatory experiences are socially, psychologically and physically stressful (Flores, et al., 2008) and have been associated with depression, loneliness, life satisfaction, cognitive functioning and reduced self-rated health (Barnes, Lewis, Begeny, Bennett & Wilson, 2012; Gee et al., 2009; Luo, et al. 2012; Shankar & Hinds, 2017; Sutin, et al., 2015; Williams, Neighbors, & Jackson, 2003).

Furthermore, a large body of research reveals that health is a reliable predictor of later life employment (Cahill, Giandrea, & Quinn, 2011; Choi, 2001; Gonzales, 2013; Munnell, 2015) when controlling for economic factors (e.g., pensions, income, wealth). One cross-sectional study found that workplace age-based discrimination is associated with turnover and desires to retire (Marchiondo, Gonzales, & Ran, 2015). In another study, we found that perceived discrimination at work predicted lower job satisfaction and self-rated health, as well as elevated depressive symptoms but was not associated with working past retirement age (Marchiondo, Gonzales, & Williams, 2017). To our knowledge, few longitudinal studies have examined how cumulative (dis)advantages relate to health or working longer (Jackson, 2001; Hinterlong, 2006;

Zajacova, Montez & Herd, 2014). While there are strong financial incentives to work longer among racial and ethnic minorities given their shortfall of retirement savings (Dushi & Iams, 2008; Orszag & Rodriguez, 2005), discriminatory risk factors may attenuate health and reduce the capacity to work longer.

To summarize, extant literature has advanced our knowledge on linkages between discrimination, health, and some aspects of labor force participation. Yet there are important limitations such as cross-sectional designs, longitudinal studies that examine only one ecological domain of discrimination (workplace, for example), and few that examine associations with retirement. Utilizing cumulative inequality theory, the objectives of this study are to (1) identify the prevalence of structural discrimination by race and ethnicity, (2) examine associations between discrimination, health, and retirement, and (3) explore whether health moderates the relationships between discrimination and work.

Methods

The *Health and Retirement Study* (HRS), a longitudinal survey of a representative sample of older adults in the United States, is the premiere data source for assessing changes in health, economic and social circumstances. Years 2006 to 2014 were chosen because they have valid and reliable measures of discrimination (Krieger, et. al., 2005; Taylor, Kamarck, & Shiffman, 2004) and significantly more racial and ethnic minorities than in previous survey years.

The psychosocial constructs (e.g., discrimination) come from the Leave Behind Questionnaire which uses a rotational study design such that respondents are interviewed in 2006, 2010 and 2014. Most of the remaining variables came from RAND HRS data files version P (2016). Data were examined with Stata SE Version 15 and assessed with the survey prefix command (svy). The Leave Behind Weight, which adjusts for population representativeness of older adults within the United States, was utilized for all analyses (Fang, 2017).

Sample

There were 18,469 individuals that reported labor force status in 2006. We then selected individuals aged 51+ (n=17,810). Half were randomly chosen to participate in the Leave Behind Questionnaire (n=7,457). Individuals who responded to the Leave Behind Questionnaire, aged 51+, and engaged with the labor force (full-time, part-time, or unemployed) were selected in

2006 and followed to 2014 (n=2,028). Among these, 958 individuals retired between 2008 and 2014, resulting in our final analytic sample.

Measures

Retirement age (dependent variable). We selected respondents that changed their labor force status to "fully retired" from 2008 to 2014 and recorded the age at which they first retired to construct the dependent variable. Among the sample of 958, the average age of retirement was 64.89 (mode 62 and ranged 54 to 92 years of age) and was normally distributed (skewness 0.91).

Major Experiences of Lifetime Discrimination is a valid and reliable measure (Clarke, Fisher, House, Smith & Weir, 2008; Williams, Yu, Jackson, & Anderson,, 1997; Williams, González, Williams, Mohammed, Moomal, & Stein, 2008) that aims to capture major experiences of discrimination ("For each of the following events, please indicate whether the event occurred at any point in your life. At any time in your life, have you ever been unfairly dismissed from a job? For unfair reasons, have you ever not been hired for a job? Have you ever been unfairly denied a promotion? Have you ever been unfairly prevented from moving into a neighborhood because the landlord or realtor refused to sell or rent you a house or apartment? Have you ever been unfairly denied a bank loan? Have you ever been unfairly stopped, searched, questioned, physically threatened or abuse by the police?"). Categories include 1=yes, 5=no. We transformed these dichotomous variables into 0=no discrimination, 1=experienced discrimination and summed them. Cronbach's α = 0.53.

Neighborhood Disadvantage. Two dimensions measured the subjective perceptions of neighborhood context: physical disorder and social cohesion (Mendes de Leon et al., 2009). "These questions ask how you feel about your local area, that is, everywhere within a 20 minute walk or about a mile of your home." An index of physical disorder included four items (vandalism and graffiti, fear to walk alone in after dark, area is kept very clean, vacancy or deserted houses or storefronts). Items were reverse coded, where higher values indicate greater levels of physical disorder. A summative scale was log-transformed due to skewness. Cronbach's coefficient for physical disorder α = 0.63. *Social cohesion* was the sum of four items (I feel part of this area; trust people; people are friendly; people will help you). It was log-transformed due to skewness. Cronbach's α coefficient for social cohesion = 0.78. Dichotomous

variables were created to represent individuals living in the most disadvantaged neighborhoods, that is, they fell below the 25th percentile of the physical disorder and social cohesion indices (Glymour, Mujahid, Wu, White, & Tchetgen, 2010).

Chronic Workplace Discrimination has high reliability and validity (McNeilly, Anderson, Armstead, Clark, Corbett, Robinson, Pieper, & Lepisto, 1996; Bobo & Suh, 2000) and measures discrimination within the workplace by managers/supervisors/boss/coworkers (How often are you unfairly given the task at work that no one else wants to do? How often are you watched more closely than others? How often are you bothered by your supervisor or coworkers making slurs or jokes about women or racial or ethnic groups? How often do you feel that you have to work twice as hard as others at work? How often do you feel that you are ignored or not taken seriously by your boss? How often have you been unfairly humiliated in front of others at work?); 1=never, 2=less than once a year, 3=a few times a year, 4=a few times a month, 5=at least once a week, 6=almost every day. Summed items were dichotomized into 0=no discrimination, 1=experienced discrimination. Cronbach's coefficient $\alpha = 0.79$.

The Everyday Discrimination Scale (Williams, Jackson & Anderson, 1997) has high reliability and validity (Krieger, Smith, Naishadham, Hartman, & Barbeau, 2005; Taylor, Kamarck, & Shiffman, 2004) and measures everyday discrimination (example, "In your day-to-day life, people act as if they are afraid of you; threatened or harassed; receive poorer service or treatment than other people from doctors or hospitals"); 1=almost every day, 2=At least once a week, 3=a few times a month, 4=a few times a year, 5=less than once a year, 6=never. The variable was log-transformed due to skewness. We also dichotomized the variable into 0=no discrimination, 1=some to almost every day discrimination. Cronbach's coefficient $\alpha = 0.76$. Respondents were given a chance to reflect on the attribution of why they were discriminated against, "What do you think is the main reason for these experiences? (Check more than one if volunteered)" with 1=Your ancestry or national origin, 2=your gender, 3=your race, etc.

Self-reported health. Individuals were asked "Would you say your health is excellent, very good, good, fair, or poor?" 1=excellent to 5=poor. This variable was reversed coded, where higher values indicate better self-rated health.

Health limits work. Individuals were asked, "Now I want to ask how your health affects paid work activities. Do you have any impairment or health problem that limits the kind or amount of paid work you can do?" 1=yes, 0=no.

Depression. Epidemiologic Studies Depression (CES-D) scale consist of questions on depression, everything is an effort, sleep is restless, felt alone, felt sad, could not get going, felt happy, and enjoyed life. Positive items were reversed coded and the sum of eight items was used. Higher values indicate greater levels of depressive symptoms. Cronbach's coefficient α = 0.80. Depression was log-transformed due to skewness and dichotomized (1=depressed).

Total Cognitive Functioning. The RAND HRS provides cognitive measure including immediate and delayed word recall (0-10), the serial 7s test (0-5), counting backwards (0-2). A total cognitive functioning score ranged from 0-27 among older adults age 51 and older; higher values indicate greater levels of cognitive functioning (Crimmins, Kim, Langa, & Weir, 2011). Self-reported memory is composed of response categories of 1=excellent to 5=poor and were reversed coded (higher values representing better self-rated memory).

Loneliness. Respondents were asked "how much they felt lonely during the past week"; answers were recoded as 1="yes lonely" if they indicated any time in the last week, else 0=not lonely.

Life satisfaction. A reliable 5-item measure (Diener, Emmons, Larsen, & Griffin, 1985) asked respondents to indicate how much they agree or disagree with the following statements: "In most ways my life is close to ideal;" "The conditions of my life are excellent;" "I am satisfied with my life;" "So far, I have gotten the important things I want in life;" and "If I could live my life again, I would change almost nothing." Cronbach's coefficient α=0.89. Higher values indicate greater life satisfaction. We also explored the single indicator "I am satisfied with my life" (0=no, 1=yes). Due to the differences in the scale of the life satisfaction across waves, the summative life satisfaction was z-transformed.

Objective Health Index-8. Respondents reported if a doctor had ever told them that he or she had a particular disease (high blood pressure, diabetes, cancer, lung disease, heart disease, stroke, psychiatric problems, and arthritis). These were 0=no, or 1=yes, and summed across the eight objective health characteristics.

Lagged variables. We assess changes in a person's life one wave prior to retiring with lagged variables. Change variables included respondents' or spouse/partner's health, employment circumstances, and caregiving for parent(s)/parent-in-law(s) as these changes can influence retirement (Munnell, Sanzenbacher, & Rutledge, 2015). The change variables were constructed by taking the status in the current wave that an individual retired minus the status in

the previous wave that information was available. For example, health change was calculated as health status in the current wave that an individual retired minus health status in the previous wave.

Race and Ethnicity. Respondents are asked to indicate their race with three categories: "1=White/Caucasian, 2=Black/African American, 3=Other" and Hispanic status as "1=Hispanic, 0=not Hispanic." To generate the race/ethnicity variable, we added the Mexican American information that was asked as "Would you say you are Mexican American, Puerto Rican, Cuban American something else? 1=Mexican American/Chicano, 7=other. Distinct groups were made with 1=non-Hispanic Black or African American, 2=Hispanic or Latino/a or Mexican American/Chicano, and 3=non-Hispanic White/Caucasian. Non-Hispanic White/Caucasian was the reference group in regressions.

Covariates. We control for cohort, race, gender, education, martial status, total household income, total household assets, and health insurance. Household income was log-transformed due to skewness and total household assets was transformed with the inverse hyperbolic sine function and given positive values (Friedline, Masa, & Chowa, 2015). We also controlled for time in Models I and II given that the Great Recession occurred during this observation period.

Analytic Strategy

The objective is to determine whether the burden of risk factors at baseline (measured in 2006) and prior to retirement (lagged) differentially impact the age of retirement, mediated by health. Ordinary least squares (OLS) regression models tested linear associations between discrimination, health, socio-demographics, and retirement age. Diagnostics of the OLS models did not suggest issues of multicollinearity (Cohen & Cohen, 2003).

Results

The average age of retirement was 64.89, and ranged from 54 to 92 (Table 1). The average retirement age in 2008 was 63.64 and increased slightly per wave (to 64.34 in 2010, 64.78 in 2012, and 66.49 in 2014), representing a cohort study among this sample. This explains why the average retirement age is slightly higher than was reported in cross-sectional research with U.S. Census data. During this observation period, Whites retired at age 65, while Hispanics

retired at age 64.66 and Blacks at ages 64.42, on average. While these are not statistically significant, they do indicate a small but important difference in the average retirement age, as well as the range. Some Whites retired at age 92 compared with a maximum age of labor force participation of 79 for Blacks and age 82 for Hispanics.

Discrimination by Race and Ethnicity (Table 2)

More than half of Blacks (52 percent) reported experiences with major lifetime discrimination, compared with 37 percent Hispanics and 36 percent Whites. Specifically, Blacks reported higher experiences of unfairly not being recruited for a job, unfairly denied a promotion, unfairly prevented from moving into a neighborhood because a landlord or realtor refused to sell or rent them a house or apartment, unfairly denied a bank loan, and unfairly stopped, searched, questioned, physically threatened or abused by the police. Some of these inequities are stark. For example, 10 percent of Blacks reported being unfairly prevented from moving into a neighborhood, compared with 1 percent among Whites or Hispanics. However, Whites (23 percent) and Hispanics (21 percent) reported higher rates of being unfairly dismissed from a job, compared to Blacks (16 percent).

More than half of Hispanics (54 percent) reported living in physically disadvantageous neighborhoods, compared with 45 percent for Blacks and 21 percent for Whites. More than a third of Blacks (38 percent) reported living in a neighborhood that was not socially cohesive, compared with 35 percent of Hispanics and 24 percent of Whites.

Nearly three quarters of Whites (73 percent) reported work discrimination, compared with 68 percent for Blacks and 63 percent for Hispanics. Whites reported higher rates than Blacks and Hispanics of unfairly being given tasks, being watched more closely, believing they have to work twice as hard, being ignored or not taken seriously by their boss, and being unfairly humiliated than Blacks or Hispanics. However, Hispanics reported higher rates of being bothered by their supervisor or coworkers than Blacks or Whites.

More than eight out of ten Whites (81 percent) experienced everyday discrimination, compared with slightly fewer for Blacks (76 percent) and Hispanics (68 percent). However, when we examined the frequency (never to almost every day), Blacks reported slightly higher frequency (1.90) than Whites (1.87) or Hispanics (1.74). The everyday discrimination scale queried about attribution: *What do you think is the main reason for these everyday experiences of*

discrimination? Overall, respondents reported discrimination due to age (28 percent), gender (15 percent), weight (11 percent), race (8 percent), physical appearance (7 percent), ancestry (4 percent), physical disability (4 percent), and sexual orientation (1 percent). When stratified by race and ethnicity, the ranking of attribution clearly shifts among minorities. Blacks overwhelmingly reported discrimination due to race (46 percent), age (13 percent), gender (11 percent), and ancestry (10 percent). Hispanics reported discrimination because of their age (23 percent), race (19 percent), ancestry (15 percent), physical appearance (12 percent), and gender (10 percent).

Health by Race and Ethnicity (Table 2)

Whites reported slightly higher levels of self-report health (3.45) when compared to Hispanics (3.32) or Blacks (3.26). However, a higher percentage of Whites reported health limitations with work (14 percent) compared with 11 percent for Blacks and 9 percent for Hispanics. Similarly, Whites reported slightly higher values on the Objective Health Index (1.52) when compared to Blacks (1.39) or Hispanics (1.23).

Hispanics had slightly higher levels of depression (1.57), followed by Blacks (1.56) and Whites (1.21). Blacks and Hispanics also had lower cognitive functioning (15.00 and 15.30, respectively) when compared to Whites (17.22). Specifically, episodic memory appears to have the greatest racial and ethnic differences (11.28 for Whites, 10.29 for Hispanics and 9.98 for Blacks). Hispanics also had higher levels of loneliness (16 percent) when compared to Blacks (13 percent) and Whites (9 percent). However, Hispanics reported slightly higher levels of life satisfaction (4.31), followed by Whites (4.29) and Blacks (3.94). To summarize, Whites reported slightly worse health on the Objective Health Index and higher rates of health limiting work when compared to Blacks or Hispanics. However, racial and ethnic minorities reported slightly worse health on the psychosocial aspects when compared to Whites.

Multivariate Regression Analyses Table 3

Different aspects of discrimination were analyzed for correlations with the main outcome measure, retirement age, while controlling for time, cohort, race, ethnicity, gender, marital status, education, total household income and wealth, and health insurance. Model I (p.22) includes discriminatory factors associated with retirement age with controls. Major discrimination was associated with a 0.86 year reduction in retirement age ($p<.001$). Perception of work discrimination reduced retirement age by about 0.77 years ($p<.05$). Neighborhood physical disorganization ($b= -0.74$, $p<.05$), social un-cohesion ($b= -0.79$, $p<.05$), and everyday discrimination ($b= -1.45$, $p<.05$) were associated with retirement age in simple regression analyses but not at the multivariate level, and subsequently removed from the final model.

Model II (p.22) includes health measures. Major lifetime and work discrimination remained significant in the expected directions. Depression was associated with retirement age ($b= -0.20$, $p<.0001$), where every unit increase in depression resulted in early retirement age of about two tenths of a year. Similarly, every unit increase in cognitive functioning resulted in approximately a tenth of a year in early retirement ($b= -0.12$, $p<.01$). Specifically, episodic memory was significantly associated with retirement age ($b= -0.19$, $p<.0001$). Objective health index was not significantly associated with retirement age in the multivariate analyses ($p=0.45$). Additional multivariate analyses (available upon request) revealed that self-reported health, loneliness, or life satisfaction were not significantly associated with retirement age at the multivariate level and were also removed for better fit of the model.

We did not find evidence supporting interaction effects of discrimination and health: Major Lifetime Discrimination X Depression ($p=0.40$); Major Lifetime Discrimination X Cognition ($p=0.70$); Work Discrimination X Depression ($p=0.13$); Work Discrimination X Cognition ($p=0.35$).

We also examined changes in respondent's life prior to retirement, while controlling for race, ethnicity, gender, education, income, wealth, and health insurance. Approximately three out of ten (28 percent) of respondents reported that their self-reported health got worse one wave prior to retirement. Interestingly, multivariate analyses suggest that they retired 0.63 years later than individual's whose health improved or stayed the same ($p<0.10$). Health insurance was also significantly related in this model ($p<0.05$), indicating that individuals whose self-reported health got worse may work longer in order to retain health insurance coverage. Prior to retirement, the

average weekly wage rate was negatively associated with retirement age ($b=-0.60$, $p<0.05$), indicating individuals with higher pay retired earlier. Individuals with longer tenure also retired later ($b=0.70$, $p<0.10$). With regards to changes in the family, approximately a quarter (25 percent) of respondents' spouse or partner's self-reported health got worse, which resulted in the respondent working longer by 0.32 of a year ($p<.05$). Approximately 5 percent of respondents cared for a parent/parent-in-law at baseline and very few (0.03 percent) became caregivers across the observation period. Although the model may be underpowered, multivariate analyses suggest that individuals who became care providers to parents retired nearly a full year later ($b=0.99$, $p<0.10$).

Discussion

The objectives of this study were to identify the prevalence of structural discrimination by race and ethnicity, examine associations between discrimination, health, and retirement, and explore whether health moderates the relationships between discrimination and work.

Empirical analyses of the structure of discrimination by race and ethnicity revealed important differences and common experiences. Blacks overwhelmingly experienced higher levels of major lifetime discrimination when compared to Whites or Hispanics, although a sizable proportion of the latter groups also experienced major lifetime discrimination. Hispanics reported higher levels of neighborhood disadvantage, yet Blacks and Whites also reported significant amounts. Finally, Whites reported the highest levels of work and everyday discrimination, with the majority of Hispanics and Whites also reporting very high levels. While discrimination is prevalent across race, ethnicity and contexts, multivariate analyses suggest that major lifetime and work discrimination induced earlier retirement. Surprisingly, we did not find relationships moderated by race, ethnicity, or health, suggesting major lifetime and work discrimination are directly associated with retirement age. These experiences not only undermine a cohesive and just society, they also attenuate longer engagement with paid work. If we were able to eliminate major lifetime discrimination, it could result in delaying retirement about a year; similarly, elimination of work discrimination can increase the retirement age by about three quarters of a year.

While discrimination was prevalent across races and ethnicities, age discrimination was identified as a common and major source of hostility, incivility, bias, and exclusion. There is

also great heterogeneity of attribution, suggesting that there might be distinct groups of individuals that perceive discrimination across age, race, ethnicity, gender, weight, physical appearance, etc. Latent class analyses may be a more suitable statistical method, along with incorporating intersectionality theory, to identify unique profiles or groups of individuals who perceive discrimination across a variety of contexts and among a number of social characteristics in later life.

We were surprised not to have found a statistically significant difference in retirement age by race and ethnicity. Murphy, Johnson and Mermin (2007) found that among Baby Boomers, African Americans expected to retire at earlier ages when compared to Whites or Hispanics. In our study, we examined actual labor force status and several aged cohorts. It might also be that older workers, irrespective of race and ethnicity, continued to hold on to their jobs for as long as possible during the Great Recession, resulting in insignificant differences of the average retirement age by race and ethnicity.

Policy Implications

"Legal frameworks make up an important piece of the fabric that holds civil society together" (Cortina, 2008, p. 70). Federal, state and employer policies and practices that protect individuals from work discrimination will likely result in expanding productive engagement among White and racial and ethnic minority workers. The Protecting Older Workers Against Discrimination Act (S. 443) is a proposed bipartisan bill currently under review in Congress. Passing this piece of legislation will reinstate the original intent of age being *a* factor to discrimination, as opposed to the *primary factor*, of the Age Discrimination in Employment Act (https://www.congress.gov/bill/115th-congress/senate-bill/443/text). Similarly, The Fair Employment Protection Act (S. 2019) aims to protect individuals from modern and covert forms of discrimination based on age and other characteristics within the workplace (https://www.congress.gov/bill/115th-congress/senate-bill/2019). The Department of Labor could collaboratively work with the president to develop guidelines for workplace or anti-discrimination statutes through executive order.

While social policy is an important intervention at the macro and mezzo levels, so too are interventions at the person-level experience that target the nature of prejudice (Allport, 1954; Cortina, 2008). Interventions are necessary to ensure that cognitive schemas and stereotypes are

never developed or nurtured throughout the lifespan and should be prevented from developing or be dismantled (Brooke & Taylor, 2005; Iweins, Desmette, Yzerbyt, & Stinglhamberg, 2013). Ageism, sexism, racism, and other prejudices take root at a young age and are rarely corrected. Organizational psychology research offers several ideas on how to challenge stereotyping and discrimination, including swift, just, and consist sanctioning of instigators within organizations (Pearson et al., 2000; Pearson & Porath, 2004); developing a "common in-group identity model" within the workplace (Gaertner & Dovido, 2000); and increasing personal awareness about biases, attitudinal dispositions, and fostering the ability to see the individual rather than a stereotype (Pettigrew & Tropp, 2006). A bundle of interventions aimed at the individual, organizational, and federal level will promote a society that is cohesive, just, free from discrimination, and productive.

Limitations

Future research can overcome the many limitations of this study. First, it was clear that individuals attribute discrimination to a number of social characteristics. Unfortunately, only the Everyday Discrimination Scale (Williams, Jackson & Anderson, 1997) asked about attribution. Querying about attribution to major lifetime discrimination and work discrimination can enhance our understanding of why individuals believe they are targeted for discrimination. Second, valid and reliable measures of discrimination were queried only twice during an eight-year period (2006 and 2010), which limited our understanding of the timing of events as they relate to health and economic outcomes. Given the findings, the *Health and Retirement Study* might want to consider including these measures on a more regular basis. This would enable future research to explore how discrimination relates to the dynamic process of retirement (Calvo, Madero-Cabib & Staudinger, 2017). We controlled for time in the multivariate models given a number of unobserved factors during the Great Recession as well as examined changes in retiree's lives prior to retirement. Future research that includes discrimination and labor force status with many observation time points could employ fixed and mixed models and control for unobserved factors or include changes in their family, employment, wealth, and health prior to retirement. Finally, propensity score analyses could enable an understanding of causal inference of discrimination on retirement.

Conclusion

        Discrimination is prevalent among older Whites, Blacks and Hispanics. Major lifetime discrimination and work discrimination directly undermine working longer. Social policies and practices that prevent discrimination will enhance the capacity of individuals to live longer into the lifespan and enhance their economic security as well as production of goods and services for society.

References

Ayalon, L., & Gum, A. M. (2011). The relationships between major lifetime discrimination, everyday discrimination, and mental health in three racial and ethnic groups of older adults. *Aging & Mental Health, 15*, 587-594, doi:10.1080/13607863.2010.543664

Broman, C. I., (1996). The health consequences of racial discrimination: a study of African Americans. *Ethnicity & Disease*, *6*, 148-53.

Cahill, K. E., Giandrea, M. D., & Quinn, J. F. (2011). Reentering the labor force after retirement. *Monthly Labor Review, 134*, 34–42.

Calvo, E., Madero-Cabib, I., & Staudinger, U. M., (2017). Retirement sequences of older Americans: Moderately destandardized and highly stratified across gender, class, and race. *The Gerontologist*, doi.org/10.1093/geront/gnx052

Cortina, L. M. (2008). Unseen injustice: Incivility as modern discrimination in organizations. *Academy of Management Review, 33*(1), 55-75.

Delgado,R. & Stephancic,C.,(2012) *Critical race theory: An Introduction*. New York: New York University Press, 2nd edition.

Fang, C. (2017, June). Personal discussion via Yeonjung Jane Lee at HRS Workshop 2017, Ann Arbor, MI.

Ferraro, K. F., & Morton, P. M. (2018). What do we mean by accumulation? Advancing conceptual precision for a core idea in gerontology. *Journal of Gerontology: Series B, 72*(2), 269-278, doi:10.1093/geronb/gbv094

Ferraro, K. F., & Shippee, T. P. (2009). Aging and cumulative inequality: How does inequality get under the skin? *The Gerontologist, 49*(3), 333-343. Doi:10.1093/geront/gnp034

Friedline, T., Masa, R. D., & Chowa, G. A., (2015). Transforming wealth: Using the inverse hyperbolic sine (HIS) and splines to predict youth's math achievement. *Social Science Research, 49*, 264-287. doi:10.1016/j.ssresearch.2014.08.018

Glymour, M. M., Mujahid, M., Wu, Q., White, K., & Tchetgen Tchetgen, E. J. (2010). Neighborhood disadvantage and self-assessed health, disability, and depressive symptoms: Longitudinal results from the Health and Retirement Study. *Annals of Epidemiology, 20*(11), 856–861. doi:10.1016/j.annepidem.2010.08.003

Gonzales, E., Matz-Costa, C. & Morrow-Howell, N. (2015). Increasing opportunities for the productive engagement of older adults: A response to population aging. *The Gerontologist*, 55(2), 252-261, doi: 10.1093/geront/gnu176

Jackson, J. S. (2001). Changes over the life course in productive activities: Comparison of black and white populations. In N. Morrow-Howell, J. Hinterlong, & M. Sherraden (Eds.), *Productive aging: Concepts and challenges* (pp. 214–244). Baltimore: Johns Hopkins University Press.

Jackson, J. S., & Knight, K.M. (2006). Race and self- regulatory health behaviors: The role of the stress response and the HPA axis in physical and mental health disparities. In K. Warner Schaie & Laura Carstensen (Eds.), *Social structures, aging, and self- regulation in the elderly* (pp.189-239). Springer Publishing Co.

Krieger, N. (2012). Methods for the scientific study of discrimination and health: An eco-social approach. *American Journal of Public Health, 102*(5), 936–945

Krieger, N., Smith, K., Naishadham, D., Hartman, C., & Barbeau, E. M. (2005). Experiences of discrimination: Validity and reliability of a self-report measure for population health research on racism and health. *Social Science & Medicine, 61*(7), 1576–1596. doi:10.1016/j.socscimed.2005.03.006

Lewis, T. T., Aiello, A. E., Leurgans, S., Kelly, J., & Barnes, L. L. (2010). Self- reported experiences of everyday discrimination are associated with elevated C-reactive protein levels in older African-American adults. *Brain, Behavior, and Immunity, 24*, 438-443

Luo, Y., Xu, J., & Granberg, E., (2011). A longitudinal study of social status, perceived discrimination, and physical and emotional health among older adults. *Research on Aging, 34*, 275-301, doi:10.1177/0164027511426151

Marchiondo, L., Gonzales, E., & Williams. L. (2017). Workplace Age Discrimination: Long-Term Relationships with Health and Retirement Intentions. *Journal of Gerontology: Social Sciences.* doi.org/10.1093/geronb/gbx095

Marchiondo, L., Gonzales, E., & Ran, S. (2015). Development and Validation of the Workplace Age Discrimination Scale (WADS). *Journal of Business and Psychology*. doi: 10.1007/s10869-015-9425-6

Miller, J., & Garran, A. M. (2008). *Racism in the United States: Implications for the Helping Professions.* Belmont CA: Thomson Brooks/Cole.

Morrow-Howell, N., Gonzales, E., Harootyan, B., Lee, Y. J. & Lindberg, B. (2017). Approaches, Policies, and Practices to Support the Productive Engagement of Older Adults. *Journal of Gerontological Social Work*, 60, 193-200, doi.org/10.1080/01634372.2016.1275912.

Munnell, A., & Sass, S. A. (2008). *Working longer: The solution to the retirement income challenge*. Washington, DC: Brookings Institution Press.

Murphy, D., Johnson, R. W., & Mermin, G. B. T., (2007). Racial differences in Baby Boomers' retirement expectations. Retrieved on May 30, 2018 from https://www.urban.org/sites/default/files/publication/46166/311414-Racial-Differences-in-Baby-Boomers-Retirement-Expectations.PDF

Ong, A. D., Fuller-Rowell, T., Burrow, A.L. (2009). Racial discrimination and the stress process. *Journal of Personality and Social Psychology, 96*(6), 1259-1271.

Orszag, P. R., & Rodriguez, E. (2005). Retirement security for Latinos: Bolstering coverage, savings and adequacy. Washington, DC: Retirement Security Project.

Pascoe, E. A. & Richman, L. S. (2009). Perceived discrimination and health: A meta-analytic review. *Psychological Bulletin, 135*(4), 531-554.

Pettigrew, T. F., & Tropp, L. R. (2006). A meta-analytic test of intergroup contact theory. Journal of Personality and Social Psychology, 90, 751–783. doi:10.1037/0022-3514.90.5.751

Warnecke, R. B., Oh, A., Green, N. Gehlert, S., Paskett, E., Tucker, K. L., Lurie, N., Rebbeck, T., Goodwin, J., Rack, J., Srinivasan, S., Kerner, J., Heurtin-Roberts, S., Abeles, R., Tyson, F., Patmios, G., Hiatt, & R. A. (2008). Approaching health disparities from a population perspective. *American Journal of Public Health, 98*(9), 1608-1615.

Williams, D. R., & Collins, C. (2001). Racial residential segregation: A fundamental cause of racial disparities in health. *Public Health Reports, 116*, 404-416.

Williams, D. R., & Mohommed, S.A. (2009). Discrimination and racial disparities in health: Evidence and needed research. *Journal of Behavioral Medicine, 32*, 20-47.

Williams, D. R., González, H.M., Williams, S., Mohammed, S.A., Moomal, H, & Stein, D.J. (2008). Perceived discrimination, race and health in South Africa: Findings from the South Africa stress and health study. *Social Science and Medicine, 67*, 441-452.

Williams, D. R., Neighbors, H. W., & Jackson, J. S. (2003). Racial/ethnic discrimination and health: Findings from community settings. *American Journal of Public Health, 93*(2), 200-208.

Williams, D. R., Yu, Y., Jackson, J. S., & Anderson, N. B. (1997). Racial differences in physical and mental health: socio-economic status, stress and discrimination. *Journal of Health Psychology, 2*, 335-351.

Zajacova, A., Montez, J. K. & Herd, P. (2014). Socioeconomic disparities in health among older adults and the implications for retirement age debate: A brief report. *Journal of Gerontology, Social Sciences, 69*(6), 973-978.

Table 1. *Retirement Age (2006-2014)*

	Overall (N=958)	White (n=719)	Black (n=134)	Hispanic/Latinx (n=78)
Retirement age	64.89 (mode 62; 54-92)	65.00 (mode 63; 54-92)	64.42 (mode 64; 54-79)	64.66 (mode 62; 57-82)

Table 2. *Baseline Characteristics Among Individuals Who Retired*

	Overall (n=958)	White (n=719)	Black (n=134)	Hispanic/ Latinx (n=78)
Cohort				
HRS/AHEAD overlap, AHEAD, CODA, HRS	24%	24%	23%	24%
War babies	39%	42%	31%	36%
Early Baby Boomers	35%	33%	44%	38%
Age	59 (52-86)	59 (52-86)	59 (52-77)	59 (52-78)
Female (1)	49%	48%	54%	50%
Race				
White/Caucasian	82%			
Black/African American	9%			
Hispanic/Latinx/Mexican	7%			
Education (years)	13.33 (0-17)	13.63 [a b]	12.67 [c]	11.09
Total household income	$96,446 (0-$5,183,947)	$106,310 [a b]	$58,985	$49,543
Total household assets	$466,643 (-$147,891 ~ $10.6M)	$525,299 [a b]	$227,801	$207,955
Marital status				
Married/partnered	73%	75% [a b]	52%	72%
Separated/divorced/never married	26%	24%	47%	27%
Number of health insurance plans	0.91 (0-4)	0.95 [a b]	0.80	0.73
Discrimination				
Major lifetime discrimination (yes=1)	37%	36% [a]	52% [c†]	37%
Unfairly dismissed from a job	22%	23%	16%	21%
Unfairly not been hired for a job	12%	11% [a]	18%	9%
Unfairly denied a promotion	13%	12% [a]	25%	16%
Unfairly prevented from moving	1%	1% [a]	10% [c]	1%
Unfairly denied a bank load	4%	3% [a]	18% [c]	4%
Unfairly stopped	6%	5% [a]	17%	8%
Neighborhood conditions				
Physical disorder (most vulnerable=1)	26%	21% [a b]	45%	54%
Social un-cohesion (most vulnerable=1)	27%	24% [a b]	38%	35%
Work discrimination (yes=1)	72%	73% [b†]	68%	63%
Unfairly given the task	56%	57%	54%	46%
Watched more closely	33%	34%	27%	29%

Bothered by your supervisor or coworker	22%	21%	20%	29%
Work twice as hard	43%	43%	42%	41%
Ignored or not taken seriously by your boss	39%	40%	33%	31%
Unfairly humiliated	22%	23% [b]	18%	11%
Everyday discrimination (yes=1)	79%	81% [b†]	76%	68%
Treated with less courtesy	2.52 (1-6)	2.50	2.72	2.37
Received poorer service	1.85 (1-6)	1.87 [b]	1.97 [c]	1.48
People act as if they think you are not smart	1.99 (1-6)	2.00	2.15	1.75
People act as if they are afraid of you	1.58 (1-6)	1.56 [a†]	1.42 [c†]	1.76
Threatened or harassed	1.37 (1-6)	1.40 [a]	1.27	1.26
Attribution of Everyday Discrimination				
Age	28%	30% [a]	13%	23%
Gender	15%	16%	11%	10%
Weight	11%	12% [a† b]	5%	3%
Race	8%	2% [a b]	46% [c]	19%
Physical appearance	7%	7%	3%	12%
Ancestry	4%	2% [a b]	10%	15%
Physical disability	4%	4%	5%	1%
Sexual orientation	1%	1%	1%	0%
Health				
Self-reported health	3.42 (1-5)	3.45	3.26	3.32
Health limits work	13%	14%	11%	9%
Depression	1.29 (0-8)	1.21 [a †]	1.56	1.57
Total cognitive functioning	16.81 (5-26)	17.22 [a b]	15.00	15.30
Episodic memory	11.04 (2-20)	11.28 [a b]	9.98	10.29
Working memory	3.92 (0-5)	4.07 [a b]	3.22	3.11
Self-reported memory	3.16 (1-5)	3.20	3.09	3.05
Attention and processing speed	1.91 (0-2)	1.91	1.90	1.93
Loneliness	11%	9% [b†]	13%	16%
Life satisfaction	4.26 (1-6)	4.29 [a]	3.94	4.31
Objective Health Index-8 (number of objective health conditions diagnosed by a physician: high blood pressure, diabetes, cancer, lung disease, heart condition, etc.)	1.49 (0-6)	1.52 [b]	1.39	1.23

Note: Percentages may not equate to 100% due to not rounding.
a = Statistically significant differences at $p<.05$ (or †=$p<.10$) between Whites and Blacks.
b = Statistically significant differences at $p<.05$ (or †=$p<.10$) between Whites and Hispanics.
c = Statistically significant differences at $p<.05$ (or †=$p<.10$) between Blacks and Hispanics.

Table 3. *Associations of Discrimination and Health with Retirement Age*

	Model I		Model II	
	b (SE)	*t*	*b* (SE)	*t*
Controls				
Time	1.63(0.13)	11.85***	1.61(0.13)	11.67****
Cohort (ref=HRS/AHEAD overlap, AHEAD, CODA, HRS)				
War babies	-5.72(0.44)	-12.76***	-5.68(0.43)	-13.09****
Early Baby Boomers	-10.22(0.44)	-23.05***	-10.18(0.45)	-22.26****
Race (ref=White/Caucasian)				
Black/African American	0.05(0.46)	0.10	-0.20(0.45)	-0.43
Hispanic/Latinx	0.12(0.36)	0.03	0.07(0.36)	0.20
Female (ref)	-1.55(0.26)	-5.94***	-1.46(0.26)	-5.49****
Education (years)	0.02(0.05)	0.41	0.05(0.05)	0.90
Marital status (married=ref)	-0.92(0.30)	-3.02**	-0.99(0.29)	-3.38***
Total household income (log)	0.06(0.14)	0.38	0.12(0.13)	0.92
Total household assets (inverse hyperbolic sine)	0.01(0.00)	1.21	0.01(0.01)	1.08
Number of health insurance plans	-0.51(0.22)	-2.32	-0.45(0.22)	-2.02*
Discrimination				
Major lifetime discrimination (yes=1)	-0.86(.25)	-3.35**	-0.74(0.25)	-2.85**
Work discrimination (yes=1)	-0.77(.29)	-2.60	-0.76(0.29)	-2.57*
Health				
Objective health index			0.09(0.11)	0.75
Depression			-0.20(0.05)	-3.79****
Cognition			-0.12(0.03)	-3.10**
N	799		788	
R^2	0.55		0.56	

Notes: ****=*p*<.0001, ***=*p*<.001, **=*p*<.01, *=*p*<.05.

Financial Management Support for SSA Beneficiaries: Looking Beyond the Payee
Annie Harper, May 2018

What Factors Explain the Decline in Widows' Poverty?
Alicia H. Munnell, Geoffrey T. Sanzenbacher, and Alice Zulkarnain, May 2018

Exploring the Rise of Mortgage Borrowing among Older Americans
J. Michael Collins, Erik Hembre, and Carly Urban, May 2018

How Might Earnings Patterns and Interactions Among Certain Provisions in OASDI Solvency Packages Affect Financing and Distributional Goals?
Melissa M. Favreault, March 2018

Distributional Effects of Alternative Strategies for Financing Long-Term Services and Supports and Assisting Family Caregivers
Melissa M. Favreault and Richard W. Johnson, March 2018

How to Pay for Social Security's Missing Trust Fund?
Alicia H. Munnell, Wenliang Hou, and Geoffrey T. Sanzenbacher, December 2017

Retirement Prospects for the Millennials: What is the Early Prognosis?
Richard W. Johnson, Karen E. Smith, Damir Cosic, and Claire Xiaozhi Wang, November 2017

Mom and Dad We're Broke, Can You Help? A Comparative Study of Financial Transfers Within Families Before and After the Great Recession
Mary K. Hamman, Daniela Hochfellner, and Pia Homrighausen, November 2017

Homeownership, Social Insurance, and Old-Age Security in the United States and Europe
Stipica Mudrazija and Barbara A. Butrica, October 2017

How Much Does Motherhood Cost Women in Social Security Benefits?
Matthew S. Rutledge, Alice Zulkarnain, and Sara Ellen King, October 2017

How Much Does Out-of-Pocket Medical Spending Eat Away at Retirement Income?
Melissa McInerney, Matthew S. Rutledge and Sara Ellen King, October 2017

Can Knowledge Empower Women to Save More for Retirement?
Drew M. Anderson and J. Michael Collins, September 2017

All working papers are available on the Center for Retirement Research website (http://crr.bc.edu) and can be requested by e-mail (crr@bc.edu) or phone (617-552-1762).